MISSOURI MONTHLY VITAL STATISTICS

Provisional Statistics

FROM THE

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Focus...Cleft Lip and Palate Defects

Oral clefts are among the most common of serious birth defects. They occur when there is a failure of normal closure of the structures of the mouth, between the fifth and twelfth weeks of gestation, leaving an opening in the lip, hard palate (roof of the mouth), or soft palate (tissue in the back of the mouth).

The causes of oral clefts have been the subject of much research, but are still poorly understood. Some oral clefts are associated with defect syndromes in which the cleft occurs along with other major anomalies, such as central nervous system defects. A genetic predisposition has long been observed; a fetus with an affected parent or sibling has a 2-4 percent risk for a development of oral cleft compared to the 0.15 percent risk for the general population.[1] Anti-epileptic medications taken in pregnancy have been shown to be associated with oral clefts, and other environmental factors are suspected, including maternal smoking, heavy alcohol intake, infections, folic acid deficiency, and Vitamin A intoxication.[2-4]

This report presents data on cleft lip and / or palate among Missouri live births from 1993-97, taken from the Missouri birth defect registry. The registry includes reported defects obtained from birth and infant death certificates, newborn hospital patient abstracts, pediatric patient abstracts through the first year of life, and the Department of Health program data base (MOCARES). While the registry data collection process may miss some cases, and include some erroneous oral cleft reports due to miscoding, cleft lip and / or palate data are believed to be generally reliable. These conditions are, in most cases, readily recognizable at birth, and 80 percent of cases are reported to the registry by two or more sources, increasing the probability that the reported defect is correct.

From 1993-97, 681 Missouri infants were born with oral clefts, or 1.9 per 1,000 live births (Table 1). Of these, 44 percent involved clefts of both the lip and palate; 18 percent were cleft lip only; and 38 percent cleft palate only. Sixteen percent occurred as part of a defect syndrome.

Table 1 shows oral clefts occur significantly less frequently among non-Hispanic blacks (1.2 per 1,000) than non-Hispanic whites (2.0 per 1,000). The difference is greater if one looks only at oral clefts not occurring as part of a defect syndrome: 1.7 and 0.7 per 1,000 for non-Hispanic white and black infants, respectively. Hispanic births have a cleft rate similar to non-Hispanic whites. Males are significantly more likely to be affected than females, with rates of 2.1 and 1.6 per 1,000, respectively.

Maternal age of forty plus is associated with an elevated risk for oral clefts. Some of the excess risk is explained by the higher rates of syndromic clefts among older mothers, but the rate of isolated cleft lip and / or palate is also higher for infants of mothers aged 40 plus (2.4 per 1,000) than those less than 40 (1.5 per 1,000).

The 2.5 per 1,000 rate of oral clefts for infants of mothers who smoke during pregnancy is 47 percent higher than the rate for infants whose mothers did not smoke. The gap when only non-syndromic clefts are examined is larger: 2.1 for smokers and 1.4 for non-smokers. There are, however, a number of possible confounders that cannot be taken into account using registry

Table 1
Orofacial Clefts (Syndromic and Non-Syndromic) by Selected Characteristics: Missouri 1993-1997

		Oral Clefts	
	Total Births	*Number*	*Rate per 1,000*
All Births	368,887	681	1.9
Race / Ethnicity			
Non-hispanic			
White	297,121	586	2.0
African-American ..	57,607	67	1.2-L
Other	7,165	13	1.8
Hispanic-All races	7,009	15	2.1
Male	189,125	388	2.1-H
Female	179,762	293	1.6
Maternal Age			
<20	52,632	99	1.9
20-29	201,919	375	1.9
30-39	109,329	191	1.7
40+	4,972	16	3.2-H
Maternal			
Smoker	75,062	188	2.5-H
Non-smoker	291,865	488	1.7
Education			
<12 yrs.	70,673	161	2.3-H
12+ years	294,042	510	1.7
Residence			
Major metro	207,669	314	1.5
Non-metro	161,230	367	2.3-H

H, L - Rate is significantly high, low ($p < .05$).

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data, including genetic factors, prenatal alcohol intake, and dietary factors. Infants of mothers with low educational attainment are at increased risk for oral clefts. Low education and smoking are highly correlated.

Residents of Missouri counties outside the St. Louis and Kansas City metropolitan areas have a higher rate of oral clefts (2.3) than those within the major metropolitan areas (1.5). While a higher proportion of metropolitan area residents are black, racial differences do not account for most of the disparity. Looking only at oral cleft rates for whites, there remains a statistically significant difference in rates between non-metropolitan (2.0) and metropolitan (1.2) residents.

Counties whose oral cleft rates rank in the highest quartile are presented in the accompanying map. The data are for both syndromic and non-syndromic clefts, and include all races. Dunklin, Lawrence, Polk, Randolph, Saline, Shelby, and Sullivan counties have statistically significant elevated oral cleft rates. The highest quartile is relatively evenly distributed throughout the rural counties.

The association between oral clefts and low birth weight, infant death, and hospital utilization indicators are shown in Table 2. Oral clefts are classified as syndromic or non-syndromic. The comparison group is infants with no birth defects. The differences between the syndromic and non-syndromic cleft groups are obvious. Infants whose clefts are one of a syndrome of defects have a low birth weight (less than 2,500 grams) rate of 48 percent, and 46 percent die within the first year of life.

Infants with non-syndromic oral clefts fare much better, yet their low birth weight rate of 111 per 1,000 is 61 percent higher than the rate for infants without birth defects. Seven of the 681 infants (1 percent) with non-syndromic clefts died in the first year, compared with 0.5 percent of infants with no birth defects.

Hospital utilization indicators are based on infants surviving to at least one week of age and include data through the first year of life. Newborn stays of more than 7 days, including neonatal transfers, were recorded for 17.9 percent of infants with non-syndromic oral clefts and 76.9 percent of these with syndromic clefts, compared with 5.8 percent of infants without birth defects. Inpatient readmissions for infants with non-syndromic clefts were over seven times more prevalent than readmissions for infants with no defects, while infants with syndromic clefts were 16 times more prevalent. Emergency room and other outpatient utilization were also higher among both cleft groups. Total average hospital charges in the first year of life were $20,545 for infants with non-syndromic oral clefts and $81,866 for those whose clefts were associated with a syndrome of defects.

Table 2 also includes data on participation by infants with oral clefts in three state assistance programs: Medicaid, Children with Special Health Care Needs, and First Steps. Infants dying in the first week of life are excluded. Data on Medicaid participation during pregnancy, obtained from the birth certificate, show 45 percent of non-syndromic and 48 percent of syndromic oral cleft infants are Medicaid recipients at birth, somewhat higher than infants without birth defects (41 percent).

The Children With Special Health Care Needs (CSHCN) program reimburses health care providers for many of the diagnostic and treatment services required for children with oral clefts, other birth defects, and other conditions, with eligibility based on family income. While the CSHCN program provides assistance to children from birth to age 21, the statistics presented in Table 2 are limited to those enrolled in the program by age one. One-third of infants with non-syndromic oral clefts and 57 percent of those with syndromic clefts participated in the CSHCN program sometime in the first year of life.

First Steps is an early intervention program for children, from birth to age three, at risk for developmental delays. Among

Table 2
Low Birth Weight, Infant Death, Hospital Utilization Indicators for Infants with Non-Syndromic and Syndromic Oral Facial Clefts and No Birth Defects: Missouri 1993-97

	Infants with		
	Non-Syndromic Oral Clefts	*Syndromic Oral Clefts*	*No Birth Defects*
Low birth weight percent	11.1	48.1	6.9
Infant death percent	1.2	46.2	0.5
Hospital Encounters per 100 infants (excludes deaths <7 days of age)			
Extended newborn stay	17.9	76.9	5.8
Inpatient readmissions	79.2	179.6	11.0
Emergency room visits	112.0	234.1	87.7
Other outpatient visits	89.9	98.9	7.9
Average 1st-yr hospital charges	$20,545	$81,866	$2,789
State Assistance Programs			
Medicaid (at birth)	45.4	47.6	40.8
Children with Special Health Care Needs	33.4	57.0	0.7
First Steps	25.9	62.8	0.7
Number of Births	575	106	348,895

(***Focus*** continued)

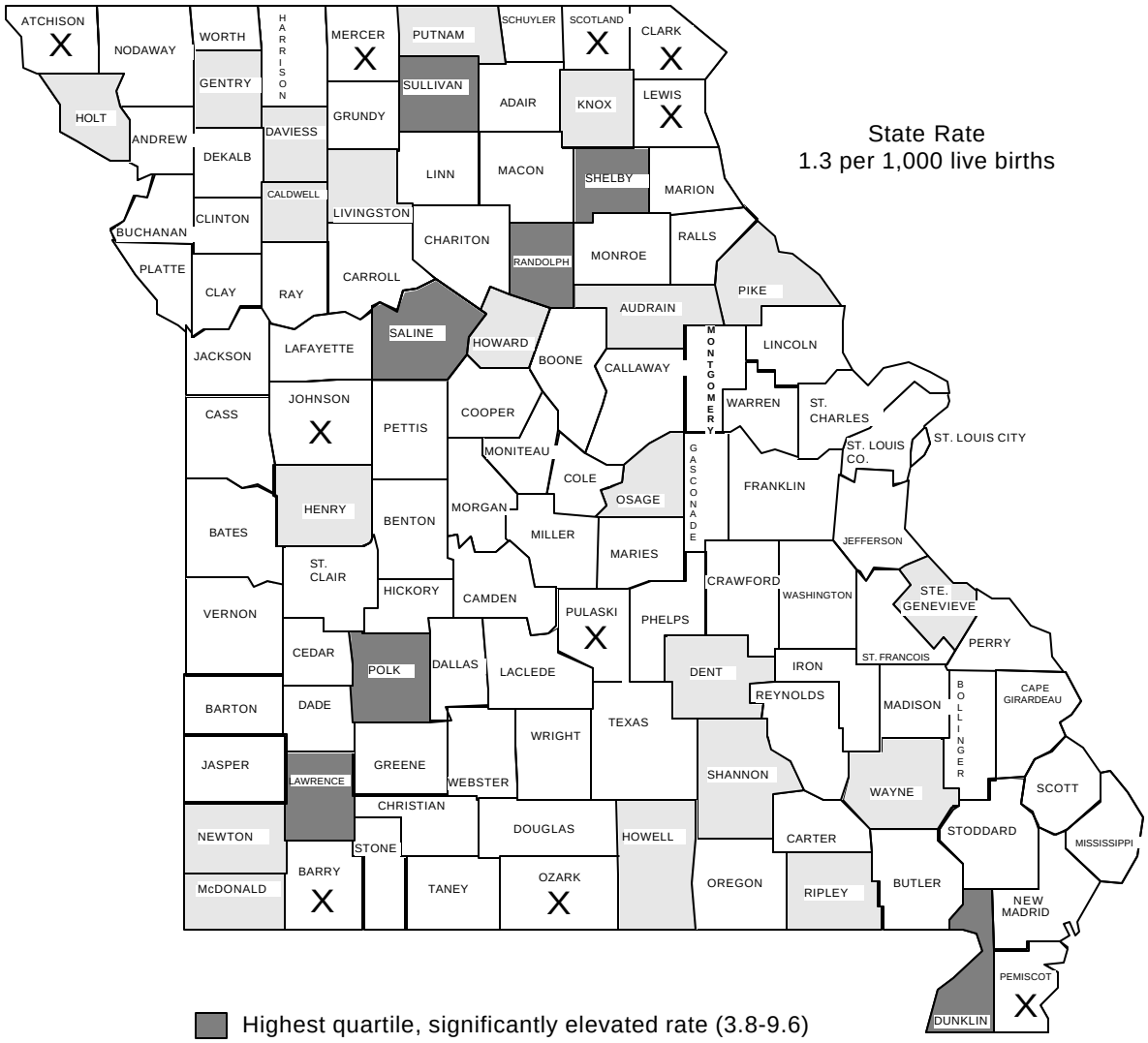
services provided are evaluation, counseling, special instruction, and therapy. There is no income requirement for participation in First Steps. One in four infants with non-syndromic oral clefts, and 63 percent of those with syndromic clefts are enrolled in the First Steps program by age one.

Infants with oral clefts face hardships throughout infancy and childhood, beyond those that can be shown through infant hospital utilization indicators.[5] Children with oral clefts are prone to feeding problems, severe ear infections which may cause permanent hearing loss if not properly treated, speech difficulties, and mild to severe orthodontic problems. Many children with severe clefts need numerous corrective surgeries throughout childhood.

In the near future, continuing genetic and epidemiologic research into oral clefts may more clearly identify risk factors. In the meantime, avoidance of maternal smoking and alcohol intake, careful use of medications, and optimal nutritional intake and folic acid supplementation, which already have been documented to affect other adverse reproductive outcomes such as low birth weight and neural tube defects, are advised.

References:
[1]Hall J, et al. Human Malformation and Related Anomalies; Oxford University Press, 1993.
[2]Lieff S, et al. Maternal Cigarette Smoking During Pregnancy and Risk of Oral Clefts in Newborns. Am J Epidemiol 1999 Oct 1; 150 (7) 683-94.
[3]Shaw G, et al. Maternal Preconceptional Alcohol Consumption and Risk for Oral-facial Clefts. Pediatr 1999 Mar; 134 (3) 298-303.
[4]Shaw G, et al. TGF-alpha Genotype Orofacial clefts, and Maternal Periconceptional Multivitamin Use. Cleft Palate Craniofac J 1998 Jul; 35 (4) 366-70.
[5]Moller K, et al. A Parent's Guide to Cleft Lip and Palate. University of Minnesota Press, 1992.

Births with Oral Clefts by County of Residence: Missouri 1993 - 1997



Provisional Vital Statistics for January 2000

LIVE BIRTHS increased in January as 6,251 babies were born compared with 5,205 one year earlier. Cumulative births for the 12 months ending with January show an increase of 2.8 percent from 74,723 in 1999 to 76,804.

DEATHS increased in January as 6,021 Missourians died compared with 4,302 in January 1999. The 1999 provisional death count of 55,400 is highest on record.

The **NATURAL INCREASE** in January was 230 (6,251 births minus 6,021 deaths) compared with 903 one year earlier. The provisional natural increase for 1999 was 19,800.

MARRIAGES decreased in January, but increased for the cumulative 12 month period ending with January.

DISSOLUTIONS OF MARRIAGE increased in January, but decreased for the 12-month period ending with January.

INFANT DEATHS increased slightly in January as 45 Missouri infants died compared with 39 in January 1999. The cumulative infant death rate for the 12 months ending with January was the same as the previous year, 7.7 per 1,000 live births.

PROVISIONAL RESIDENT VITAL STATISTICS FOR THE STATE OF MISSOURI

Item	January				12 months ending with January							Provisional	
	Number		Rate*		Number			Rate*				2000	
	1999	2000	1999	2000	1998	1999	2000	1997	1998	1999	2000	Number	Rate*
Live births	5,205	6,251	11.2	13.0	73,573	74,723	76,804	13.5	13.6	13.7	14.0	75,200	13.8
Deaths	4,302	6,021	9.2	12.6	54,366	52,429	56,674	10.1	10.0	9.6	10.4	55,400	10.2
Natural increase	903	230	1.9	0.5	19,207	22,294	20,130	3.5	3.5	4.1	3.7	19,800	3.6
Marriages	2,816	2,711	4.7	6.0	44,308	44,232	45,209	8.3	8.2	8.1	8.3	45,000	8.3
Dissolutions	1,938	2,423	4.2	4.2	25,898	25,556	25,141	4.7	4.8	4.7	4.6	24,600	4.5
Infant deaths	39	45	7.5	7.5	574	579	594	7.9	7.8	7.7	7.7	575	7.6
Population base (in thousands)	...	...	5,408	5,439	...	...	...	5,368	5,411	5,442	5,471	...	5,439

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.